CLAIMS

1. A phosphor element comprising:

a pair of electrodes facing each other; and

a phosphor layer interposed between the pair of electrodes and including a semi-conductive phosphor fine particle in which at least a part of a surface is covered with a conductive organic material.

2. The phosphor element according to claim 1, wherein the conductive organic material is chemically adsorbed on the surface of the semi-conductive phosphor fine particle.

3. The phosphor element according to claim 1 or 2, wherein the semi-conductive phosphor fine particle has a particle diameter of 1 μm or less.

4. The phosphor element according to any one of claims 1 to 3, wherein the semi-conductive phosphor fine particle includes oxide or composite oxide including at least one element selected from the group consisting of Zn, Ga, In, Sn and Ti.

5. The phosphor element according to any one of claims 1 to 4, wherein the phosphor layer is so configured that the semi-conductive phosphor fine particles are dispersed in a transparent conductive matrix.

6. The phosphor element according to any one of claims 1 to 5, further comprising an electron transport layer between the phosphor layer and at least

one of the electrodes.

7. The phosphor element according to any one of claims 1 to 6, further comprising a thin film transistor connected with at least one of the pair of electrodes.

8. A display device comprising:

a luminescent array in which phosphor elements are arranged in two dimensions, wherein the phosphor element comprises:

a pair of electrodes facing each other;

a phosphor layer interposed between the pair of electrodes and including a semi-conductive phosphor fine particle in which at least a part of a surface is covered with a conductive organic material; and

a thin film transistor connected with at least one of the pair of electrodes;

a plurality of x electrodes, in parallel with each other, extending in a first direction in parallel with a face of the luminescent array; and

a plurality of y electrodes extending in parallel with a second direction, orthogonal to the first direction, in parallel with the face of the luminescent array, wherein a thin film transistor of the luminescent array is connected with the x electrode and the y electrode, respectively.